

A Further Remark on the "Halleian Syllogism"\*

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In the past few years, there has been a rebirth of interest in Halle's (1959) classic argument against the phoneme; Sullivan (1975), Christie (1976), Lamb and Vanderslice (1976), and Lockwood (1977) have all proposed reanalyses of Halle's Russian data, and Sadock (1976) and Sommerstein (1977) offer methodological critiques. Most of these discussions have been somewhat negative in tone, and given the rather widespread agreement<sup>1</sup> among contemporary phonologists concerning the success of Halle's argument, as well as the considerable use of arguments roughly of the form of Halle's in later linguistic arguments, it seems to me that this argument deserves further methodological examination. This paper will present such an examination (section 1), together with a discussion of the above mentioned reanalyses of the Russian data (section 2) and methodological critiques (section 3) in the light of the methodological reanalysis presented in the first section.

1. A methodological reanalysis of the "Halleian syllogism".

It is worth considering Halle's argument itself in some detail here; neither Sadock nor Sommerstein cites actual passages from Halle, and it is perhaps not unlikely that this is the reason why they have (in my view) not fully understood the structure of Halle's argument.

Halle (1959:21-3) argues that the level of the (classical) phoneme should be rejected as a valid level of linguistic structure. His argument is essentially that the following "requirement has played a particularly important role in the development of American linguistics" (numbering Halle's):

Condition (3a): A phonological description must include instructions for inferring (deriving) the proper phonological representation of any speech event, without recourse to information not contained in the physical signal.

If this condition is accepted, Halle maintains, it follows that in Russian, where "voicing is distinctive for all obstruents except /c/, /č/ and /x/, which do not possess voiced cognates, we would have to give the following analysis of voicing assimilation (note that in Russian, essentially,<sup>2</sup> all obstruents are voiceless word-finally "unless the following word begins with a voiced obstruent, in which case they are voiced"): the phonetic forms [mók l, i], [móg bɪ], [žéc l, i] and [žéj bɪ] would be represented phonologically as /mók l, i/, /móg bi/, /žéc l, i/ and /žéc bi/, respectively. He continues as below:

- (1) Moreover, a rule would be required stating that obstruents lacking voiced cognates--i.e. /c/ /č/ and /x/--are voiced in position before voiced obstruents. Since this, however, is true of all obstruents, the

net effect of the attempt to meet both Condition (3) and (3a) would be a splitting up of the obstruents into two classes and the addition of a special rule. If Condition (3a) is dropped, the four utterances would be symbolized as follows: {mók 1, i} {mók bi} {žéc 1, i} {žéc bi},<sup>3</sup> and the above rule could be generalized to all obstruents, instead of only {č} {c} {x}. It is evident that Condition (3a) involves a significant increase in the complexity of representation...If Condition (3a) can be dispensed with, then there is also no need for the 'phonemic' representation.

It is my contention that, contrary to Sadock and Sommerstein, there is nothing at all wrong with the form of this argument, and that if we accept that Halle maintained implicitly what would undoubtedly be for him an obviously true minor premise, this argument has the form roughly of classical modus tollens.<sup>4</sup> It will be reconstructed as a first approximation, as in (2).

- (2) If "Condition (3a)" (roughly, classical phonemics) is adopted, then a significantly complex representation results. The representation should not be so complex. Therefore, Condition (3a) must not obtain.

As just suggested, the minor premise in this reconstruction is never explicitly stated by Halle,<sup>5</sup> and should not be so complex, but it is fairly clear from the rest of his discussion of this issue that he would subscribe to this view. In fact, however, the force of the argument probably comes not so much from the relative complexity of the representations required as from the "splitting up of the obstruents into two separate classes." Although Halle again is not explicit on the matter, this too is something which should not be done. That is, the result of Condition (3a) is treating a unitary phenomenon as two separate phenomena. Let us reconstruct (2) in these terms, then, as (2'):

- (2') If Condition (3a) is adopted, Russian voicing assimilation must be two separate phenomena.  
Russian voicing assimilation is a unitary phenomenon.  
Therefore, Condition (3a) must not obtain.

Thus, if we accept the first two statements in (2'), we must conclude that Halle's argument is quite successful in demonstrating the weakness of theories which entail a classical phonemic level of representation. What is especially interesting about this argument, it seems to me, is that most phonologists appear to agree about Halle's assessment of the situations as embodied by the premises in (2')<sup>6</sup> (further discussion of this point is given in the next two sections).

It is worth pointing out that Halle's argument does not establish (even if we accept his premises), namely, the lack of any level between Chomsky's (1964) "systematic phonemic" level and his "systematic phonetic" level. Thus, Halle's argument is not relevant to theories which posit



an intermediate level which does not correspond to the classical phonemic level,<sup>7</sup> including theories which make use of (variants of) Praguian archi-phonemes or Firthian prosodies, or which include an additional level abstract enough to allow for Halle-type representations at this level, such as the level of lexical representation in the "natural phonology" of Stampe (1973). In view of the comment in Halle (1959:21n), it would appear that Halle, unlike Chomsky (1964, 1966, 1967), never intended to establish such a further conclusion via this argument.

We need not accept Halle's premises, of course. What is peculiar about this argument, again, is that almost everybody has accepted it (with the qualification given in note 6), even Halle's critics. The remainder of this paper will be devoted to a consideration of the issues which have in fact been raised with respect to Halle's argument by his critics.

## 2. The reanalyses.

There have been several attempts to reanalyze Halle's data so that an intermediate 'phonemic' level can be maintained, mainly by stratificational grammarians, although the nonstratificationists Johns (1969) and Christie (1976) have also presented sketches of reanalyses. It is noteworthy that all of these reanalyses explicitly depart from classical phonemic theory. Thus, Lamb (1966) and Sullivan (1975) make use of what appears to be a variant of Firthian prosodic analysis, while Johns (1969) and Lockwood (1972) seem to appeal to something along the lines of a Praguian archi-phoneme.<sup>8</sup> That is, none of these linguists has argued that the solution that Halle presented as the classical phonemicist solution is in fact the correct one. Moreover, they all appear to agree that the solutions that Halle argues against is in fact the standard classical phonemic analysis. Lamb (1966:544), for example, states that "the phonemic analysis which Halle criticizes is the traditional one." The fact that all of these investigators, despite their opposition to Halle's solution, agree on these points (i.e., essentially that the premises in (2') are true) would appear to provide strong support for the claim made above that most linguists agree with the premises of Halle's argument. Furthermore, I know of no published work that would indicate that its author disagrees with these premises.<sup>9</sup> However, as the stratificationists point out, since their analyses do not follow classical phonemic principles, Halle's argument is not relevant to these reanalyses.

## 3. Sadock on the "Halleian syllogism".

I will discuss for the most part only Sadock's critique here, since it is more strictly methodological than Sommerstein's, and is considerably more complete (Sommerstein states, for example (1977:121), that Halle's conclusion does not follow from his premises without ever giving what he takes Halle's conclusion to be.) Sadock's critique concerns both Halle's original argument and later arguments which have the form of Halle's, although only the former is discussed in detail. He intends (1976:85) "to establish that arguments of the form of Halle's should not be used in the way that they have been." Sadock gives an "outline" of Halle's argument (pp. 85-6), repeated below in (3):

- (3) ...Halle showed that autonomous phonemics imposed on the grammarian a treatment of Russian in which two separate, but complementary, voicing assimilation rules are required.



In a grammar without an autonomous phonemic level, however, he showed that it was possible to describe the voicing alternations in Russian in terms of one general, and hence simple, voicing assimilation rule. From these facts Halle concluded that there is no level of autonomous phonemics.

He goes on to the effect that "as the argument stands, this conclusion is clearly a nonsequitur." However, two sorts of "background assumptions" would be able to patch up the argument: "(a) that we have a priori knowledge that the general solution is correct in Russian, or (b) that general descriptions are always the correct descriptions of selected data in natural language." He then rejects (1976:86-8) both of these assumptions, and ends up by deciding (p. 88) that "the most that can be made to follow from Halle's argument is the very much weaker conclusion that (all other things being equal) the theory in which the general solution is possible is to be preferred," perhaps on the grounds that it is more "falsifiable" in Popper's (1965) sense. He concludes that Halle's analysis is indeed more falsifiable than the "phonemic" analysis, and therefore (p. 91) "should be examined as a working hypothesis before the less general treatment is" on the basis of the following considerations (pp. 89-90). Halle's theory is essentially that all obstruents assimilate in voicing to following obstruents, while the "phonemic theory" is that "some obstruent morpho-phonemes assimilate in voicing to following obstruents" and "some obstruent phonemes occur as the voiced allophones before voiced obstruents." But if Russian were just like it is except that "[c], say, failed to alternate, Halle's theory would be disconfirmed...", while the phonemic theory would not. Hence, "the power of Halle's argument, it seems to me, lies partly in the gross difference in testability between his treatment and the phonemic treatment." A final bit of evidence (p. 91) for his "contention about the lack of force of the Hallean syllogism" is that neither side in the generative semantics-lexicalist debate recognizes the other's arguments as being damaging to its position, despite the fact that these arguments often are of the form of Halle's.

What Sadock apparently means, in terms of the reanalysis presented above, when he rejects "background assumption...(a)" is that, roughly, he rejects the minor premise in (2'). (He evidently finds nothing to quarrel about in the major premise.) But, as noted above, he also makes a "contention about the lack of force of the Hallean syllogism," which I take as meaning he is unhappy with the form of the argument (cf. also the first quotation above). These are two separate issues, although it seems to be Sadock's unwillingness to accept Halle's premise that leads him to his conclusions about the argument's force, and I will attempt to keep them apart insofar as possible in the following discussion.

As I pointed out above, Sadock appears to be very much in the minority as far as his misgivings about accepting the minor premise are concerned. His reasons for rejecting "background assumption" (a) above (which would be essentially our minor premise if we replace "the general solution" by 'a general solution') are that (p. 86) accepting it "would reduce linguistic analysis to vacuity since, if we had a priori knowledge of the correct description of natural language facts, all we would need to do in describing a language would be to examine our intuitions as to the correct description." But Sadock has oversimplified the issue, and also



appears to be confusing his "background assumptions" (a) and (b). What is required to establish our minor premise is not a priori knowledge but a reasonable degree of certainty (cf. note 4), and not about correct analyses, but about incorrect ones (i.e., any analysis which makes it appear as if Russian voicing assimilation is two processes is incorrect). This says nothing more than that linguists have learned something by their investigations of language (note also that this makes the "knowledge" involved not a priori, but a posteriori). I can see no reason why having fairly clear intuitions about what kinds of analyses are incorrect in certain cases "would reduce linguistic analysis to vacuity," or even why such intuitions about correct analyses in a small number of cases should have this effect (although this kind of case would presumably be much rarer than that involving incorrect analyses). It is important to note in this regard that it is not necessary to have any particular degree of certainty about the correctness of Halle's analysis, as the existence of alternative analyses indicates--all that Halle's argument requires is a fair degree of certainty about the incorrectness of the classical phonemicist solution (or any solution which makes Russian voicing assimilation appear to be two separate phenomena).

Having rejected this premise, however, Sadock is faced with the fact that Halle's argument has nonetheless been found quite convincing by most linguists. It is evidently this fact which led him to analyze it in terms of falsifiability. But the relative degree of falsifiability of the two analyses appears to have little, if anything, to do with their acceptability, as the following considerations indicate. Suppose that we change the "phonemic theory" slightly so that instead of Sadock's formulation we have something like 'all obstruent morphophonemes assimilate in voicing to following obstruents' (this is essentially Halle's formulation of the rule in the "phonemic theory"--see (1) above) and 'all obstruent phonemes occur as the voiced allophones before voiced obstruents.' This formulation will get the right results as long as it is not necessary to have a morpho-phonemic representation to correspond to every phonetic (and phonemic) representation, since we could simply not set up morphophonemic representations for forms involving the voiceless phonemes which do not have voiced counterparts. The first rule would then take care of 'morphophonemic' voicing assimilation and the second would take care of the rest. I know of no injunctions by classical phonemicists against such an analysis, and it appears to conform (at least as well as Sadock's does) to their actual practice in a fair number of cases. With this modification, the two analyses would appear to have the same degree of falsifiability; whatever would falsify one would also falsify the other. Yet, it seems to me, the revised analysis is no more tenable than that given by Sadock, and I suspect that Halle's critics (cf. section 2) would agree on this point. (At any rate, their reanalyses would lead one to believe that they would, since such an analysis has never been proposed by any of them). The reason is that it still makes Russian voicing assimilation look like it is two separate processes. Thus, it would appear that degree of falsifiability has nothing to do with the success of Halle's argument. Neither, it would seem, does simplicity (cf. Sadock's outline of Halle's argument), for the stratificationists do not appear to be at all bothered by the fact that they require two rules, one to get from the morphophonemic level to the phonemic level, and one to get from there to the phonetic level. What is important to them, and to Halle's argument, is that voicing assimilation is done by one rule.<sup>10</sup>



The difference between the degree of success of Halle's argument and the syntactic arguments cited by Sadock is undoubtedly due to the fact that the general agreement about the premises in Halle's case is not present in the case of these other arguments. This should not seem terribly surprising--we know a good bit more about phonology than we do about syntax.

#### Footnotes

\*This paper is a revised version of a section of my Ohio State University Ph.D. dissertation (Churma 1979). I would like to thank Fred Householder and David Stampe for their helpful comments on a preliminary version.

<sup>1</sup>As will be seen below (cf. especially section 2), this agreement is probably more widespread than might at first glance appear to be the case.

<sup>2</sup>There is a slight complication (Halle 1959:63): "{\*v} functions as a sonorant and as an obstruent if followed by an obstruent." (\*v) represents the incompletely specified version of the morphophoneme {v}).

<sup>3</sup>The braces are used to denote what later came to be called "systematic phonemic" representations (cf. Chomsky 1964).

<sup>4</sup>Actually, the argument form probably should be what I have termed "almost modus tollens", since the premises in the argument are known only probabilistically, and not with certainty (cf. Churma 1979, Ch. 2 for details). For purposes of exposition, I will treat the argument as an instance of actual classical modus tollens; nothing crucial appears to be lost by such a simplification.

<sup>5</sup>This lack of explicitness in the statement of the premises of arguments presented is apparently not at all uncharacteristic of arguments given by working linguists (cf. Churma 1979), or, I suspect, those given by practitioners of other sciences.

<sup>6</sup>Actually, condition (3a) is probably not sufficient to require the analysis that Halle presents as that embraced by classical phonemics (cf. the references cited in section 2 for discussion). However, this is not crucial for Halle's argument to be considered a modus tollens-like refutation of the brand of classical phonemics which would advocate an analysis like the one presented by Halle. There is some condition, which apparently has not been explicitly formulated by its advocates, which would (be likely to--cf. note 4) entail such an analysis. Halle's argument then suffices, if we accept his minor premise, to refute any theory which embraces this analysis. For purposes of ease of presentation, I will continue to act as if it is condition (3a) which is responsible for this analysis.

<sup>7</sup>The use of the definite article here may be somewhat misleading, since there were after all several versions of what might fairly be called "classical phonemic theory." The "long components" of Harris (1951), for example, would not be countenanced by Bloch, Trager, Smith, etc.,



and yet all of these could be considered classical phonemicists, as could the Praguians. Not all of these theorists would advocate the analysis which Halle argues against, so "the" classical phonemic theory should be interpreted in the context of this discussion as that version which would advocate the analysis in question, i.e., that of Bloch et al.

<sup>8</sup>Lockwood (1977) claims that his 1972 analysis did not make use of the archiphoneme, and that Sullivan's (1975) analysis did (Sullivan also makes the latter claim), but I feel that the interpretation I just gave is closer to the truth. Sullivan's analysis does have some archiphonemic characteristics but his postulation of a "phoneme" of voicing seems to put him closer to the Firthians than to the Praguians. Comparison of stratificational analyses with other types of analyses is complicated by the stratificationalists' use of "singular" features (cf. Lockwood 1972) instead of the more or less standard binary features. Fortunately, the only crucial issue is whether or not the analyses in question depart from classical phonemic theory, and there appears to be general agreement that they do.

Chomsky's (1966, 1967) claims that Lamb's analysis is a notational variant of Halle's appear to be due to a natural enough misinterpretation of that analysis to the effect that the output of Lamb's "single rule" is the phonetic representation, rather than the phonemic representation as Lamb apparently intended. (There must then be, of course, an additional rule or rules which Lamb does not mention to derive the phonetic representation, which is apparently what led to Chomsky's confusion). Sullivan's analysis, which is quite similar in other respects to Lamb's, does in fact contain such a rule.

<sup>9</sup>The only possible exception of which I am aware is Ferguson (1962: 288), who presents some considerations in favor of the classical phoneme, and may be hinting that he does not feel that Halle's solution is "more natural" than the one he criticizes. However, Ferguson is not explicit concerning his views on the matter. (F. Householder (personal communication) also explicitly states that he does not accept Halle's minor premise.) It is also possible that Sadock rejects Halle's minor premise (see below).

<sup>10</sup>Whether or not voicing assimilation is in fact a single phenomenon is in principle an empirical question. Thus, if the voiceless obstruents without voiced counterparts could be shown to behave differently than the others (say in loan words), there would be good reason to suspect that what is involved is not a unitary phenomenon at all. I know of no discussion in the literature along these lines, however.

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